"Math is Cool" Championships-2003-04

6th Grade - February 27, 2004
Individual Contest

Express all answers as reduced fractions unless stated otherwise.
Leave answers in terms of π where applicable.
Do not round any answers unless stated otherwise.
Record all answers on the colored cover sheet.

1	Jon wants sausage, pepperoni, and tomatoes on his pizza, Aaron wants pepperoni and olives, Josh wants anchovies and Lee wants pineapple, what percentage of them want pepperoni on their pizza?
2	Merck Dogg has 18 lines in a song with Dr. Sampo and he averages 11 syllables per line, how many syllables are in his section of the song?
3	Evaluate: $\sqrt{16} \times \sqrt{25}$
4	Evaluate: 17 × 6 ÷ 2 × 0 + 16 ÷ 4
5	Evaluate: 3 + 3 × 2
6	How many inches are in 2 feet?
7	Britney had $40 that her dad gave her for her birthday. If she gave half of her money to her mom and gave $5 to her brother and spent $2 on candy, how much money, in dollars, will she have left?
8	Round 2.718281828 to the nearest thousandth
9	If Brynna weighs 107 lbs and Jon can bench press 215 pounds, how many whole Brynnas can he bench press?
10	What is 10% of $100.00 in dollars?
11	Amy is fifteen years old and plans to attend college when she is 18. She makes $100 per month and saves half of every paycheck for when she enters college. If she works for exactly 36 months, how much money will she have saved in dollars?
12	What is the area of a square with perimeter 28?
13	Mike went to the gas station to fill up his car. The gas cost $14.79. On the way to the cashier, he grabbed a Mathlete 5000 Power Bar which cost 50¢. If he gave the cashier $20, how much money should Mike receive in change, in dollars?

14	Solve for x: $x + 3 = -7$
15	What time is it 45 minutes before two hours after a half an hour until Luke's bedtime if Lukes bedtime is 7:30 pm?
16	Jon calls Katherine 'Googgy'. Jon calls her 'Katherine' only when he is really mad at her, and he is very mad at her every 26 weeks. How many times does he call her 'Katherine' during a 3 year period?
17	What is the 21st term of the sequence 1,5,9,13,17...
18	Biff and Eho are ski racing. Biff is traveling at 7 m/s and Eho is traveling at 9 m/s. How many meters ahead is Eho after 20 seconds?
19	Tanya bought groceries that totaled $83.39 before tax. If tax was 6%, how much would her groceries cost with tax to the nearest cent?
20	Googgy wants to calculate how far Googgyland is from Jonland. If it takes Googgy 8.5 hours to drive her purple Mazda Miata at 72 mph from Googgyland to Jonland, how many miles apart are they?
21	Katherine bakes 72 chocolate chip cookies. If Himes eats 1/6 of the cookies, Jon eats 1/5 of the remaining cookies, Chad eats 1/3 of the remainder, Brian eats $\frac{1}{2}$ of that remainder, and Kevin eats 3/4 of that remainder, how many cookies are left for Katherine?
22	Colin and Brian order a pizza with a radius of 6 inches. If Brian eats 1/4 of the pizza, and Colin eats the rest, what is the area of the pizza that Colin eats?
23	Keisha is 5 feet and 9 inches tall when she is barefoot, but she often wears 3 inch heels. What percentage of her height do her shoes make up when she is wearing them? Round to the nearest percent.
24	What is the units digit of 6^{999} ?
25	How many cubes one foot on a side will Colin need to make a cube one yard on a side?
26	The square root of 420 is between two integers. What is the two integer's product?
27	A cube has a volume of 64. What is its surface area?
28	The difference between two numbers is 26 and their sum is 40. What is their product?
29	What is the probability of rolling a sum of seven with two six-sided dice and then flipping a head on a fair coin?

30	Lee's pencil is 3 cm longer than Aaron's pencil before Lee puts his in a pencil sharpener. After he sharpens it, it is 8 cm long and 2/3 the length of Aaron's pencil. How long was Lee's pencil originally in centimeters?

Challenge Questions

31	If a quadrilateral has sides of lengths 3,4, and 5, what is the maximum integral length of the 4^{th} side?
32	After playing the first 25% of his tennis matches this seasons, Colin won 20% of his matches. What percent of his remaining matches must he win to win 50% of his matches?
33	True or False: The data set 1,2,3,4,5,6,7,8,9,10 has the same median as mean.
34	If Teddy rides his bike to school at 20 mph and rides home the same way at 25 mph, what is his average speed in miles per hour?
35	If Kelly were to invest $200 into her savings account and the annual interest rate is 3%, how much money will she have in two years in dollars?
36	How many ways can you arrange the letters in the word POTATO?
37	Colin had an average of 96% on his statistics tests going into the last test. He didn't take the last test and his grade fell to 80%. Assuming each test is worth the same number of points, how many tests were there, including the test Colin didn't take?
38	If an equilateral triangle with side length s has an area A, what is the area of a regular hexagon with side length s in terms of A?
39	The World Series of baseball, a famous sporting event, is played between two teams. As soon as either team wins 4 games, that team is declared World Champions (no game can end in a tie.) If a World Series is played between two teams of equal ability (so that each team's probability of winning any game is $\frac{1}{2}$), what is the probability that the World Champions are declared after only 4 games?
40	At a classroom costume party, the average age of the b boys is g, and the average age of the g girls is b. If the average age of everyone at the party (all these boys and girls, plus their 42-year-old teacher) is b+g, what is the value of b+g?

"Math is Cool" Championships-2003-04

6th Grade - February 27, 2004

Team Multiple Choice Contest

Record answers on colored answer sheet.

Xavier is documenting information about his academy's cafeteria food. The below information is from the beginning of one particular week at the cafeteria. Note: The number in stock refers to the number of items the cafeteria currently has.

Sandwiches		
Item	*Number in Stock*	*Price*
Turkey	230	$3.20
Egg Salad	425	$2.50
Roast Beef	520	$3.00
Cheese	230	$1.30

Drinks		
Item	*Number in Stock*	*Price*
Soda	410	$1.25
Juice	345	$1.00
Milk	765	$0.50

Extra Items		
Item	*Number in Stock*	*Price($)*
Pizza Slice	120	$1.00
Cookie	245	$0.50
Bag of Peanuts	130	$0.30
Brownie	130	$0.75
Bag of Chips	160	$0.75
Pasta	70	$1.00

Questions

1	What is the minimum amount a student must pay to purchase a sandwich, a drink, and an extra item? A) $2.60 B)$1.60 C)$2.30 D)$2.10 E) Answer Not Given
2	If Elise has $3.00 and she wants a turkey sandwich, milk, and a brownie for lunch, how much money does she need to borrow from her friends? A)$1.55 B) $l.45 C)$1.25 D) $1.35 E) Answer Not Given
3	If Xavier sold his entire stock of extra items, which item would make him the most money? A) Bags of Chips B) Pizza Slices C) Bags of Peanuts D) Brownies E) Cookies
4	If Xavier has set the price of the items to 3/2 times the price he paid for them, how much would he make in profit if he sold all of his pizza and peanuts? Profit is defined as total amount made minus total cost. A)$159 B)$53 C)$106 D)$79.50 E) Answer Not Given
5	How many different lunches costing $4.00 total or less can a student purchase if a lunch must include one sandwich, one drink, and one extra item? A)28 B)27 C)26 D)25 E) Answer Not Given
6	Without using the number of sandwiches in stock, Xavier calculates the average price of the sandwiches. If he is thinking about adding a new sandwich and he wants the average price to go down by 10%, what should the price of the new sandwich be? A)$l.25 B)$2.25 C)$2.00 D)$1.80 E) Answer Not Given
7	Ben's friends give him $9.15 to buy some extra items. If Ben does not buy cookies, brownies, or pasta for his friends, and the number of bags of chips equals the number of bags of peanuts, how many slices of pizza did Ben buy for his friends? A)12 B)9 C)6 D)3 E) Answer Not Given
8	Because of recent news about Mad Cow Disease, Xavier expects a 30% decline from this week to the following week in the number of roast beef sandwiches sold. If only 75% of the roast beef sandwiches are sold this week, how many should he order if he wants to have 100% of the sandwiches sold in the following week? Assume the sandwiches stay fresh forever. A)390 B)130 C)273 D)143 E) Answer Not Given
9	As a deal at the Academy, each student can purchase a meal, which includes 1 sandwich, 1 drink, and 2 extra items. How many different combinations of meals can a student make if both her extra items are different? A)72 B) 144 C) 180 D)360 E) Answer Not Given

"Math is Cool" Championships-2003-04

6th Grade - February 27, 2004
Team Contest

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Leave answers in terms of π where applicable.
Do not round any answers unless stated otherwise.
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1	An ant is standing on the top edge of a can of soup that is $8/\pi$ cm across and 15 cm tall. The ant walks from the point where he starts to the point at the bottom of the can directly below his starting point and walks once completely around the can while walking the shortest possible distance. Assuming the can is a perfect cylinder, how many cm long was the ant's trek?
2	Thirty-seven members of the Lewis and Clark Math team were told to write the 6th grade "Math is Cool" contest. Fourteen members wrote the contest, fifteen members typed the contest, fifteen members proofread the contest, five members typed and proofread, seven members wrote and proofread, and four members wrote and typed the contest. If six members goofed off and did nothing, how many participated in all three activities?
3	Find the sum of the first 10 terms in the sequence 1,1,2,3,5,8,13,21,...
4	Libbey, Luke, Lee, Keisha, and Josh stand in a line. Libbey must stand next to Lee and refuses to have her or Lee stand next to Luke. How many ways can they stand in a line?
5	What is 1/2(3(11+7)-12)-11?
6	Lauren receives a box of truffles for Valentine's Day in which all twelve truffles look the same. 3/4 of them are fruity inside and 2/3 of the remaining are coffee flavored. 1/3 of the fruit flavored ones are raspberry and 1/6 of the remaining fruit flavored truffles are strawberry. Lauren only recognizes coffee flavor, raspberry flavor, and strawberry flavor. What is the probability that she will draw a flavor she doesn't recognize?
7	Josh wants to paint his tile floor half blue and half white with the dividing line running from the upper left corner to the lower right corner. The floor is 12 tiles by 12 tiles and all of the tiles are square. How many tiles have blue paint on them?
8	Every morning Keisha is 100% math nerd. Every time she interacts with someone else, she gives them 50% of her nerdiness. If Keisha interacted with five people in one day, what percent math nerd is she at the end of the day? Answer as a decimal.
9	Several Gonzaga basketball fans stand in a circle and take turns around the circle yelling out names of the twelve players on the team. If they say the names in the same order each time around the circle and if each name is said at least six times and four names were said seven times after two times around the circle, how many fans are in the group?
10	Trip and Keisha play a game in which they try to kick each other in the toosh. Trip is winning the war because he has 60% more hits than Keisha. If Trip has a total of 48 kicks, how many kicks is he beating Keisha by?

Person #1 Practice Relay $4 + 7 - 3 \times 3$	2
Person #2 Practice Relay TNYWG squared	4
Person #3 Practice Relay 17-TNYWG+12	25
Person #4 Practice Relay Square root TNYWG	5
Person #1 Relay #1 7^2 - (8+5)	36
Person #2 Relay #1 What is the sum of the first three prime numbers and the square root of TNYWG?	16
Person #3 Relay #1 Find the sum of the tenth number in the series 1, 1, 2, 3, 5, 8... and TNYWG.	71
Person #4 Relay #1 What is the square root of the sum of the 11^{th} prime number, the opposite of the first prime number and TNYWG?	10
Person #1 Relay #2 Find the number of ways you can arrange the letters in the word COLIN.	120
Person #2 Relay #2 What is product of TNYWG and the probability getting three heads with the toss of three quarters?	15
Person #3 Relay #2 Find the area of a right triangle with base length 3 and hypotenuse length 5. What is this area times TNYWG/2?	45
Person #4 Relay #2 What is positive difference between TNYWG and the square root of 625?	20

Practice Relay
Person#1
$4 + 7 - 3 \times 3$

Practice Relay
Person#1
$4 + 7 - 3 \times 3$

Practice Relay
Person#1
$4 + 7 - 3 \times 3$

Practice Relay
Person#1
$4 + 7 - 3 \times 3$

Practice Relay
Person#2
TNYWG squared

Practice Relay
Person#2
TNYWG squared

Practice Relay
Person#2
TNYWG squared

Practice Relay
Person#2
TNYWG squared

Practice Relay
Person#3
17-TNYWG+12

Practice Relay
Person#3
17-TNYWG+12

Practice Relay
Person#3
17-TNYWG+12

Practice Relay
Person#3
17-TNYWG+12

Practice Relay
Person#4
Square root TNYWG

Practice Relay
Person#4
Square root TNYWG

Practice Relay
Person#4
Square root TNYWG

Practice Relay
Person#4
Square root TNYWG

Relay #1
Person#1
7^2 - (8+5)

Relay #1
Person#1
7^2 - (8+5)

Relay #1
Person#1
7^2 - (8+5)

Relay #1
Person#1
7^2 - (8+5)

Relay #1
Person#2
What is the sum of the first three prime numbers and the square root of TNYWG?

Relay #1
Person#2
What is the sum of the first three prime numbers and the square root of TNYWG?

Relay #1
Person#2
What is the sum of the first three prime numbers and the square root of TNYWG?

Relay #1
Person#2
What is the sum of the first three prime numbers and the square root of TNYWG?

Relay #1
Person#3
Find the sum of the tenth number in the series 1, 1, 2, 3, 5, 8... and TNYWG.

Relay #1
Person#3
Find the sum of the tenth number in the series 1, 1, 2, 3, 5, 8... and TNYWG.

Relay #1
Person#3
Find the sum of the tenth number in the series 1, 1, 2, 3, 5, 8... and TNYWG.

Relay #1
Person#3
Find the sum of the tenth number in the series 1, 1, 2, 3, 5, 8... and TNYWG.

Relay #1
Person#4
What is the square root of the sum of the 11th prime number, the opposite of the first prime number and TNYWG?

Relay #1
Person#4
What is the square root of the sum of the 11th prime number, the opposite of the first prime number and TNYWG?

Relay #1
Person#4
What is the square root of the sum of the 11th prime number, the opposite of the first prime number and TNYWG?

Relay #1
Person#4
What is the square root of the sum of the 11th prime number, the opposite of the first prime number and TNYWG?

Relay #2

Person#1

Find the number of ways you can arrange the letters in the word COLIN.

Relay #2

Person#1

Find the number of ways you can arrange the letters in the word COLIN.

Relay #2

Person#1

Find the number of ways you can arrange the letters in the word COLIN.

Relay #2

Person#1

Find the number of ways you can arrange the letters in the word COLIN.

Relay #2
Person#2
What is product of TNYWG and the probability getting three heads with the toss of three quarters?

Relay #2
Person#2
What is product of TNYWG and the probability getting three heads with the toss of three quarters?

Relay #2
Person#2
What is product of TNYWG and the probability getting three heads with the toss of three quarters?

Relay #2
Person#2
What is product of TNYWG and the probability getting three heads with the toss of three quarters?

Relay #2
Person#3
Find the area of a right triangle with base length 3 and hypotenuse length 5. What is this area times TNYWG/2?

Relay #2
Person#3
Find the area of a right triangle with base length 3 and hypotenuse length 5. What is this area times TNYWG/2?

Relay #2
Person#3
Find the area of a right triangle with base length 3 and hypotenuse length 5. What is this area times TNYWG/2?

Relay #2
Person#3
Find the area of a right triangle with base length 3 and hypotenuse length 5. What is this area times TNYWG/2?

Relay #2
Person#4
What is positive difference between TNYWG and the square root of 625?

Relay #2
Person#4
What is positive difference between TNYWG and the square root of 625?

Relay #2
Person#4
What is positive difference between TNYWG and the square root of 625?

Relay #2
Person#4
What is positive difference between TNYWG and the square root of 625?

"Math is Cool" Championships-2003-04

6th Grade - February 27, 2004

Mental Math Contest

Express all answers as reduced fractions in terms of radicals and π, where applicable, unless otherwise instructed.

Person #1		
1	What is the product of the first three prime numbers?	30
2	What is one half plus one third?	5/6
3	How many ways can you arrange the letters in the word ZIP?	6 [ways]
4	The U.S.S. Enterprise can travel at 5000 miles per second when using impulse drive. If Earth is 100,000 miles away, how many seconds will it take the Enterprise to reach Earth?	20 [seconds]
Person #2		
1	What is the smaller degree measure between the hands of a clock at 3:00?	90[E]
2	What is the perimeter of a square with side length 3?	12
3	What is two times three plus three minus four times two?	1
4	Lee has nickels and dimes in his pocket. If he has 40 cents altogether and a total of 5 coins, how many nickels does he have?	2 [nickels]
Person #3		
1	Colin can mow a yard in one hour. Lee can mow the same yard in two hours. How long in hours will it take the two of them to mow the same yard working together in hours?	2/3 [hours]
2	If x equals 3, what is x squared plus 1?	10
3	Calvin has five pens, four pencils, and three markers in his pencil pouch. If each writing utensil is the same size and weight, what is the probability he randomly draws a pencil out of his pencil pouch?	1/3
4	What is one fourth of one third of two sixths?	1/36
Person #4		
1	Solve for x: 3x+1=7	2
2	If Trisha has two scarves, two pairs of pants and three shirts, how many different outfits can she make if an outfit consists of one of each article of clothing?	12 [outfits]
3	What is the next number in the sequence:1/2, 1/4, 1/8, ...	1/16
4	Find the product of the greatest common divisor of 6 and 3 multiplied by their least common multiple	18

"Math is Cool" Championships-2003-04

6th Grade - February 27, 2004

College Knowledge Bowl Questions #1		
1	Luke is playing basketball. If he makes 60% of his free throws, how many would you expect him to make if he attempts 35 free throws?	21 [free throws]
2	Will has a gallon of di-hydrogen-monoxide. Throughout the day he drinks 3/4 of it. How many cups of it does he have left at the end of the day?	4 [cups]
3	Ryan's internet pet requires two different kinds of digital food to survive. One type is a red drink with 3 calories and the other is a blue drink with 5 calories. In one day he feeds the pet a total of 33 items of digital food for a total of 123 calories. How many blue drinks did he give his internet pet?	12 [blue drinks]
4	If Colin can push 86 buttons on his calculator per minute, and Aaron can push 93 buttons per minute. What is the total number of buttons they push in half an hour?	5,370 [buttons]
5	What is the smallest prime factor of 21?	3
6	A balloon filled with helium maintains an altitude of 20 feet above sea level when it is full. If it loses half of its helium and half its height every day, what fraction of a foot will its altitude be after 5 days?	5/8 [feet]
7	A garbage bag can hold 78 wads of paper. If it is halfway full to capacity, how many more wads can it hold?	39 [wads]
Number ***8*** is an extra question. Only use it if needed.		
8	What is the sum of the first prime number and the square root of 169?	15

"Math is Cool" Championships-2003-04

6th Grade - February 27, 2004

College Knowledge Bowl Questions #2		
1	What is the hypotenuse of a right triangle with sides 6 and 8?	10
2	If 5 members of the math team each shake hands with all the other members, how many handshakes occur?	10 [handshakes]
3	A strength quotient is the three lift total divided by body weight. If Jon bench presses 215 lbs and squats 325 lbs, how much must he power clean to have a strength quotient of 4.2 if he weighs 175 lbs?	195 [lbs]
4	The phone book of the town Mathville has 75,000 names and phone numbers in it. If each page has 375 names and numbers and there are only pages with names and numbers, what is the probability that you open the book randomly to the 65th page?	1/200
5	The oldest ancestor of Great-great-Grampy Sampasaurus is 564,549 years old. Due to the inaccuracies of carbon dating, what is the ancestor's age, in years, rounded to the nearest hundred?	564,500 [years]
6	Solve for x: $x + 7 = -2$	[x=] -9
7	What is the probability of getting 2 heads when you flip 2 coins?	1/4
Number ***8*** is an extra question. Only use it if needed.		
8	The ratio of boys to girls on the math team is 5 to 7. If there are 21 girls on the math team, how many people are there total?	36 [people]

"Math is Cool" Championships-2003-04

6th Grade - February 27, 2004

College Knowledge Bowl Questions #3		
1	What is the remainder when 2004 + 2003 +2002 + 2001 is divided by three?	0
2	If today is Friday, what day was it 107 days ago?	Wednesday
3	What is the next number in the sequence 1, 2, 4, 8, 16, ... ?	32
4	27 minutes after 10 am is how many minutes before 1:00 pm?	153 [minutes]
5	If Biff pushes a rock 5 feet up a 41 foot high hill every day, and Eho comes at night and pushes it back down the hill 1 foot, how many days will it take for Biff to reach the top?	10[days]
6	There are 90 people left on Sampson Survivor. The game is over when 1 winner is selected from the 90 finalists. If Kai, Teddy, and Luke are still in the running to win. What is the probability that one of them wins? Express answer as a fraction	1/30
7	Elise's backpack is full of books. When she has 5 books in her backpack it weighs 25 pounds. Assuming all the books weigh the same amount and the backpack itself weighs 5 pounds, how many pounds would the backpack weigh if Elise was only carrying 3 books?	17 [pounds]
Number ***8*** is an extra question. Only use it if needed.		
8	Mr. Sampson has 3 hours to make brownies for his home room class. For every dozen brownies he makes it takes him on average of 18 minutes. What is the maximum number of brownies he can make in the 3 hours before home room starts?	120 [brownies]

"Math is Cool" Championships -- 2003-04

6th grade - February 27, 2004

School Name_____Team #_____

Proctor Name_____Room #_____

Key

Full Name:_____

1st Score

Out of 40

Individual Contest - Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	50 [%]		
2	198 [syllables]		
3	20		
4	4		
5	9		
6	24 [inches]		
7	[$] 13		
8	2.718		
9	2 [Brynna's]		
10	[$] 10.00		
11	[$] 1800		
12	49		
13	[$] 4.71		
14	[x=] -10		
15	8:15 pm		
16	6 [times]		
17	81		
18	40 [meters]		
19	[$] 88.39		
20	612 [miles]		

	Answer	1 or 0	1 or 0
21	4 [cookies]		
22	27π [inches squared]		
23	4 [%]		
24	6		
25	27 [cubes]		
26	420		
27	96		
28	231		
29	1/12		
30	15 [cm]		
31	11		
32	60 [%]		
33	True		
34	200/9 [mph]		
35	[$] 212.18		
36	180 [ways]		
37	6 [tests]		
38	6A		
39	1/8		
40	8		

"Math is Cool" Championships -- 2003-04

6th grade - February 27, 2004

School Name_____Team #_____

Proctor Name_____Room #_____

Key

Team Multiple Choice Contest-Score Sheet

1st Score

Out of 18

Correct responses are worth 2 points, incorrect responses are worth -1 point and no response is 0 points.

DO NOT WRITE IN SHADED REGIONS

	Answer	-1, 0 or 2	-1, 0 or 2
1	D		
2	B		
3	E		
4	B		
5	E		
6	A		
7	C		
8	D		
9	C		

"Math is Cool" Championships -- 2003-04

6th grade - February 27, 2004

School Name_____Team #_____

Proctor Name_____Room #_____

Key

1st Score

Out of 10

Team Contest-Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	17 [cm]		
2	3 [members]		
3	143		
4	24 [ways]		
5	10		
6	1/2		
7	78 [tiles]		
8	3.125 [%]		
9	38 [fans]		
10	18 [kicks]		

"Math is Cool" Championships -- 2003-04

6th grade - February 27, 2004

School Name_____Team #_____

Proctor Name_____Room #_____

Key

Relay Contest - Score Sheet

Practice relay
2
4
25
5
Answer for relay #1
36
16
71
10
Answer for relay #2
120
15
45
20